



# Bison Oil Well Cementing Single Cement Surface Pipe

Date: 8/18/2015  
 Invoice # 80433  
 API# 05-123-41906  
 Foreman: Calvin Reimers

**Customer:** Anadarko Petroleum Corporation  
**Well Name:** Powers 35N-22HZ

County: Weld  
 State: Colorado  
 Sec: 22  
 Twp: 2N  
 Range: 65W

Consultant: Bryan / Hayden  
 Rig Name & Number: Noble 2  
 Distance To Location: 40 Miles  
 Units On Location: 4023-3104/4033-3203  
 Time Requested: 800am  
 Time Arrived On Location: 710am  
 Time Left Location: 10:45 am

WELL DATA	Cement Data
Casing Size OD (in) : <u>9.625</u>	Cement Name: <u>BFN III</u>
Casing Weight (lb) : <u>36.00</u>	Cement Density (lb/gal) : <u>14.2</u>
Casing Depth (ft.) : <u>1,854</u>	Cement Yield (cuft) : <u>1.49</u>
Total Depth (ft) : <u>1870.96</u>	Gallons Per Sack: <u>7.48</u>
Open Hole Diameter (in.) : <u>13.50</u>	% Excess: <u>15%</u>
Conductor Length (ft) : <u>60</u>	Displacement Fluid lb/gal: <u>8.3</u>
Conductor ID : <u>15.5</u>	BBL to Pit: <u>30</u>
Shoe Joint Length (ft) : <u>42</u>	Fluid Ahead (bbls): <u>30.0</u>
Landing Joint (ft) : <u>10</u>	H2O Wash Up (bbls): <u>15.0</u>
Max Rate: <u>6</u>	Spacer Ahead Makeup
Max Pressure: <u>1750</u>	<u>30 bbls With Dye in 2nd 10 bbls</u>

Calculated Results	Pressure of cement in annulus
<b>Displacement:</b> <u>140.82 bbls</u> (Casing ID Squared) X (.0009714) X (Casing Depth + Landing Joint - Shoe Joint)	<b>Hydrostatic Pressure:</b> <u>1367.67 PSI</u>
<b>cuft of Shoe</b> <u>18.43 cuft</u> (Casing ID Squared) X (.005454) X (Shoe Joint ft)	<b>Pressure of the fluids inside casing</b>
<b>cuft of Conductor</b> <u>48.30 cuft</u> (Conductor Width Squared) -(Casing Size OD Squared) X (.005454) X (Conductor Length ft)	<b>Displacement:</b> <u>781.08 psi</u>
<b>cuft of Casing</b> <u>1008.28 cuft</u> (Open Hole Squared)-(Casing Size Squared) X (.005454) X (Casing Depth - Conductor Length )	<b>Shoe Joint:</b> <u>31.32 psi</u>
<b>Total Slurry Volume</b> <u>1075.01 cuft</u> (cuft of Shoe) + (cuft of Conductor) + (cuft of Casing)	<b>Total</b> <u>812.41 psi</u>
<b>bbls of Slurry</b> <u>191.46 bbls</u> (Total Slurry Volume) X (.1781)	<b>Differential Pressure:</b> <u>555.26 psi</u>
<b>Sacks Needed</b> <u>721 sk</u> (Total Slurry Volume) ÷ (Cement Yield) X (% Excess Cement)	<b>Collapse PSI:</b> <u>2020.00 psi</u>
<b>Mix Water</b> <u>128.49 bbls</u> (Sacks Needed) X (Gallons Per Sack) ÷ 42	<b>Burst PSI:</b> <u>3520.00 psi</u>
	<b>Total Water Needed:</b> <u>314.31 bbls</u>

X Bryan Brown  
 Authorization To Proceed

Customers hereby acknowledges and specifically agrees to the terms and condition on this work order, including, without limitation, the provisions on this work order.



# SERIES 2000

